36TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 53.

REPORT

OF THE

SECRETARY OF THE TREASURY,

COMMUNICATING

The results of the investigation made pursuant to the joint resolution of the 26th of February, 1857, "to prevent the counterfeiting of the coins of the United States."

JUNE 14, 1860.—Read, and ordered to be printed.

TREASURY DEPARTMENT, *June* 13, 1860.

SIR: Pursuant to the joint resolution of the 26th of February, 1857, "to prevent the counterfeiting the coins of the United States," I have the honor to report that Professors Henry Vethake and R. E. Rogers were appointed on the 18th July, 1857, commissioners to inquire "into the processes and means proposed by J. T. Barclay for preventing the abrasion, counterfeiting, and deteriorating the coins of the United States." These two gentlemen were selected for that duty from their high character as scientific men, and from their reputed familiarity with the general subjects involved in the investigation. They accepted the appointment, and appear to have pursued the inquiries with as much diligence and dispatch as they were enabled to do under the circumstances.

On the 23d April last, their report, of which a copy is herewith inclosed, was received at this department. I immediately addressed to them a letter, of which the following is a copy:

TREASURY DEPARTMENT, *April* 23, 1860.

GENTLEMEN: Your letter of the 17th instant is received with your report upon the processes proposed by Dr. J. T. Barclay for the protection of the coinage, expressing in general terms your confidence in them, but suggesting that it will be impossible to exhibit these processes in a practical shape unless a sufficient appropriation is made for the necessary machinery. Allow me to request that you estimate the cost of the machinery required for that purpose.

I beg leave further to ask from you an estimate of the probable cost of having the coinage of the Mint conducted according to Dr. Barclay's processes instead of the present mode.

I am aware that a specific and detailed estimate of this character can hardly be expected, but I will thank you to furnish such an approximation as will enable me to gather some opinion of the cost, independent of any remuneration to Dr. Barclay.

Very respectfully, your obedient servant,

HOWELL COBB,
Secretary of the Treasury.

Professors ROGERS and VETHAKE,
Philadelphia.

In response to this request, I have received from the commissioners their letter of the 31st ultimo, which is herewith transmitted with the inclosures therein referred to, from which it appears that the probable cost of producing a specimen coin according to Dr. Barclay's processes is estimated at $4,300, and that a similar amount will be required for coins of each denomination, independent of the ordinary processes of the Mint, as well as any remuneration to Dr. Barclay.

The foregoing results of the investigation ordered by the joint resolution are respectfully submitted to the consideration of Congress.

Very respectfully, your obedient servant,

HOWELL COBB,
Secretary of the Treasury

Hon. JOHN C. BRECKINRIDGE,
Vice President of the United States and
President of the Senate.

PHILADELPHIA, *May* 31, 1860.

DEAR SIR: We have the honor to acknowledge your letter of April 23, requesting us to furnish you with estimates of the cost of exhibiting, in practical shape, the processes proposed by Dr. James T. Barclay, for protecting the coinage and of adapting the present minting arrangements to Dr. Barclay's method; and would, in reply, transmit the inclosed communications from Mr. James F. Hieskell, Dr. Barclay's representative, and from Mr. Daniel Gilbert, machinist, and Mr. E. G. Chormann, engraver.

Desiring to place the responsibility where it should rest, we made application, on the receipt of your communication, to Mr. Hieskell for the information called for; and, after receiving from him the estimates rendered by Messrs. Gilbert & Chormann, have, by personal interviews with them, learned the grounds upon which they base their calculations, of *forty-three hundred dollars*, for their joint work.

Knowing the high personal character of these individuals, and their standing as workmen in their respective branches, we feel no hesitation in testifying to the fairness and reasonableness of their estimates, and in expressing the belief that, through their aid, the results which they promise can be accomplished.

Of the cost of substituting for the present system the minting processes of Dr. Barclay, we find it impossible to furnish an estimate, but

will endeavor, by conveying to the department the information we possess, to enable it to arrive at some general opinion.

The devices of Dr. Barclay will require scarcely any alterations—certainly no radical ones—in the coining presses, nor in the machinery for rolling the bars, nor any important changes in that for cutting the planchets. A machine for each size of coin will need to be added to such as now exist, the cost of which can only be arrived at after the work proposed by Mr. Gilbert in his estimate has been executed.

In explanation of our delay in communicating this reply, we would state that, being compelled to appeal to others for the estimates, we have deemed it proper to allow them their own time to deliberately make their calculation.

We are, with great respect, your obedient servants,

R. E. ROGERS,
HENRY VETHAKE,
1121 *Girard street.*

Hon. HOWELL COBB,
Secretary of the Treasury.

PHILADELPHIA, *May* 22, 1860.

GENTLEMEN: It gives me pleasure to reply to your communication of the 25th ultimo, in which you state that you have been requested by the Secretary of the Treasury to furnish him with an estimate of the cost of machinery requisite for producing "a specimen coin," embodying Dr. James T. Barclay's proposed plans for *protecting* the coinage of the country; also, the probable cost of having the coinage at the Mint conducted according to Dr. Barclay's method, and asking me (as the representative of Dr. Barclay) to put you in possession of the desired information.

In answer to the first query, I beg leave to inclose the estimate of Mr. E. G. Chormann (engraver and die-sinker) for the artistic, and that of Mr. Daniel Gilbert (machinist) for the mechanical branches. I have great confidence in the skill of both these gentlemen, as well as in their knowledge of the subject.

As to the second query, no specific amount could be named; but I can see no reason why the coinage, according to Dr. Barclay's method, should be more costly than the present one, (or, at all events, than the more careful and exact work of the European mints,) after the machinery had been once adapted to the new mode; which adaptation, I imagine, would not be more expensive than the renewals and alterations the present machinery is subject to. And, if the success of the former should inspire the department with confidence to undertake the latter, it will afford me sincere gratification to communicate my views as to the best manner of introducing the same in the most suitable mode.

Awaiting your further commands, I am, with high respect, yours most truly,

JAMES F. HIESKELL,
Attorney for Dr. James T. Barclay.

Professors ROBERT E. ROGERS and HENRY VETHAKE,
Commissioners, &c.

PHILADELPHIA, *May* 19, 1860.

Being conversant with the plans proposed by Dr. J. T. Barclay for the improvement of the coinage, (having been engaged in the recent experiments connected therewith,) I will agree to engrave all the dies (for the facial and peripheral devices) that may be required for the production of a specimen coin, for the sum of twenty-five hundred dollars ($2,500.) I will guaranty the same to be in accordance with recent experiment, embracing Dr. J. T. Barclay's method of improving the coinage of the United States.

Respectfully, your obedient servant,

E. G. CHORMANN.

MR. JAMES F. HIESKELL.

PHILADELPHIA, *May* 19, 1860.

DEAR SIR: Having had several interviews with Dr. James Barclay, and by him been made acquainted with certain plans for improving the coinage of the United States, and having been for about fifteen years in the employ of the United States Mint as a practical machinist, and having knowledge of the machinery and coining operations of the Mint, and at the request of Mr. James F. Hieskell, said Dr. James Barclay's agent, I herewith engage to construct the machinery, and to produce the mechanical results as proposed by said Dr. Jas. Barclay, or his agent, Mr. James F. Hieskell.

My estimate for machinery and services is for the sum of eighteen hundred dollars; payments to be made at such times and ways as may be agreed upon at the time of the contracting.

Very respectfully submitted, by

DAVID GILBERT.

Report of the Commissioners.

PHILADELPHIA, *April* 17, 1860.

SIR: The undersigned, appointed as commissioners to examine into the methods proposed by Dr. James T. Barclay, for preventing the abrasion, counterfeiting, and deterioration of the coins of the United States, beg leave to make the following report:

We received the notification of our appointment to conduct the investigations in the summer of 1857, and so soon thereafter as our own professional engagements permitted, and the arrangements of Dr. Barclay were made for the purpose, we entered upon the duties, and have continued to devote our attention to the subject down to the present time.

Frequent and occasionally prolonged interruptions have occurred in the course of the investigation, but these have been unavoidable, and have arisen, in a great degree, from the necessity forced upon Dr.

Barclay to often spend much time in the effort to devise *cheap* expedients to accomplish ends for which the appropriation of Congress would have been altogether inadequate, had regular minting machinery been constructed.

An apartment in the Mint, at Philadelphia, was placed at our service by the director, as a workshop for Dr. Barclay, in the execution of some of the mechanical details of the experiments, and as a convenient office for our frequent interviews, and was so made use of until May, 1858. The small amount of bullion, in the shape of gold and silver planchets, which was required from time to time in the experiments, was supplied likewise by the director of the Mint. The chemical experiments have, in the main, been conducted in the laboratory of the University of Pennsylvania.

From the nature of the suggestions and devices submitted by Dr. Barclay for our examination and criticism, our inquiries have necessarily taken a somewhat wide range, and been various in their character.

They had been conducted partly by direct research through mechanical and chemical experiment, partly by tentative process, or successive steps of trial, and partly by an appeal to the experience and knowledge of practical artists and workmen; and have frequently involved the investigation of collateral matters, as preliminary to the solution of the main question. It is proper, however, in this connection, to state that, although we have pushed our examination of the subject as far as the resources at our command have permitted, and believe a point has been reached from which we are prepared to communicate to the department a definite expression of our convictions, we yet feel that, owing to a want of sufficient funds at our disposal, to defray the cost of the construction of machinery, and to compensate those who alone were competent to carry out in *practical* detail most of the proposed devices of Dr. Barclay, a *promising beginning only* has been made towards the development of a system which, when attained, cannot fail to confer the most important benefits upon society.

As indicating the character of the inquiries which have engaged our attention, and in explanation of the form we have thought it desirable to give to this communication, we herewith transcribe the memorial of Dr. Barclay, presented in 1857, and which gave rise to the action of Congress on the subject, and the joint resolution of Congress authorizing the investigation with which we have been intrusted. The former sets forth, in general terms, the propositions which Dr. Barclay assumes to establish, and the latter exhibits the sum of the instructions we have received for our guidance.

Left to decide in our own judgment upon the course best calculated to meet the views of Congress, as expressed in that resolution, and which would at the same time seem most fair to both the government and Dr. Barclay, we have deemed it proper to limit our report to a detail of such of the evils pointed out by him, to which the coins of the country are liable, as in our view came within the scope of the investigations, with an expression of opinion derived from careful experiment and other modes of inquiry, upon the feasibility and merits of the several methods and devices by which he proposes to correct them. As yet, the "processes and means for preventing the abrasion,

counterfeiting, and deterioration of the coins of the United States," into which we have been appointed to inquire, are the property of Dr. Barclay, (or have been so claimed by him,) and have, we conceive, been intrusted to our confidence solely for the purpose that their practicability should be tested, and so reported upon. To reveal them to the public in this stage of the investigation, and in the present relative position of Dr. Barclay and the government, would be to open the way to much possible interference with his rights, by those who, in this country or abroad, might feel tempted to take advantage of his suggestions. We, therefore, do not contemplate entering into any account or explanation of the *modes* by which he designs to carry into effect the details of his system, since, while such a course does not seem called for by our interpretation of the "resolution," it would involve a compromise of his private interests.

In the communications, written and otherwise, which we have received from Dr. Barclay, he has submitted the following three propositions:

First. That the coins of the United States sustain a very serious loss from the ordinary wear and tear of circulation, and that much of this amount can be as easily saved as lost.

Second. That our coins are extensively, profitably, and speciously counterfeited and impaired in value, and government thereby subjected to great expense, and society to serious inconvenience and loss, on account of this great and growing evil.

Third. That every method of counterfeiting, at all *specious* and *dangerous*, can be entirely prevented, and that all the other attempts upon the integrity of coin, that have hitherto been devised, can either be altogether frustrated, or so materially obviated as to be rendered virtually impossible.

These propositions may be treated of in the order in which they have been presented.

Natural abrasions of coin by circulation—its diminution.

That all coin in circulation suffers loss by natural abrasion, is a fact universally admitted. The *amount*, however, of the loss, or, in other words, the annual average abrasion, which it sustains, is not generally appreciated nor easily determined. Every individual occasionally meets with coin which, to the senses, gives evidence of a serious diminution of value, the result of wear, while the mints, banks, and those who deal in bullion have constant occasion to discover the same fact by an appeal to the scale beam. Yet, how long such coin has been in *active* circulation, and to what peculiar influences of abrasion it may have been subjected, are circumstances which cannot with certainty be ascertained. To solve such a question, therefore, even approximately, it becomes necessary to extend the observations over large collections of coins, and to make them upon those derived from various branches of trade and commerce. It has not, of course, been possible for us to institute any experiments of the kind, even if it had been called for in the investigation of the suggestions of a remedy by Dr. Barclay. We may, therefore, refer to the conclusions which

others have arrived at, based upon the experiments heretofore conducted upon the subject.

By experiments made in the British mint, and at the Mint of the United States, it has been ascertained:

That coins lose more the first year after they are put in circulation than subsequently.

That coins of small denominations lose more in proportion than those of large value, from the fact that smaller coins expose a greater relative surface than those which are larger.

That the loss in gold and silver is nearly the same.

The loss is estimated by Mr. Jacobs, for English coin, at one part *in four hundred and twenty in the year*, and by Prof. Tucker, for the coin of the United States, at one part in *two hundred*, for the same period.

Assuming for the calculation the intermediate figure of one part in three hundred, it may be safely concluded that in the United States the annual loss by abrasion of gold and silver coins amounts, at the date of Dr. Barclay's memorial, to scarcely less than three-fourths of a million of dollars; the bullion currency being estimated by the Secretary of the Treasury, in his annual report to Congress for 1855, at $250,000,000. At the same rate, the aggregate loss with the present increased circulation would no doubt largely exceed a million.

The suggestions of Dr. Barclay for reducing a portion of this enormous annual loss are founded upon the correctness of the facts above cited.

The method by which he proposes to save to the government that portion of the loss which all *new coin* suffers very quickly after being thrown into circulation is prompt and efficient, and commends itself for adoption.

To diminish that larger loss which the coins suffer, in their continual round of circulation, Dr. Barclay urges, and with force of good reasoning, that since the amount of abrasion of coin is in a direct ratio to its extent of surface and degree of embossment, and inversely as these are diminished, the coins of each of the dimensions, and especially the larger ones, should be reduced in diameter and made thicker, and the character of the engraving upon each face materially modified.

That this obviously important principle of contracting the surface in order to diminish the abrasion, should not have been carried further than has been done in our coinage, is ascribable doubtless to the fear of the drill and saw, a fraud to which the *increased thickness* would invite.

Were the proposed changes open to the objection, that a coin so constructed could thus be tampered with, we could not hesitate to condemn it as not only an undesirable, but a dangerous innovation.

But these changes have been submitted to us as a *part of a plan*, and cannot fairly be judged of but in connection with the other devices, with which Dr. Barclay proposes to associate them, providing against the danger of the drill and saw.

Viewed in this light, we would respectfully recommend the suggestions as well worthy the attention of the government.

In investigating next the suggestions of Dr. Barclay, having refer-

ence to the counterfeiting and debasement of the coins of the country, and in order to feel prepared to form a more correct judgment of the feasibility of the devices by which he proposes to prevent them, it became an important duty to inform ourselves, as far as practicable, of the nature of the frauds attempted upon the coinage, and the method by which they are effected.

Our inquiries have brought us to the conclusion that the counterfeits and other attempts upon the integrity of our coins are very numerous, when counted in all their slight modifications of detail, but that they may all be embraced, so far as their principal features are concerned, under the following fourteen varieties:

I. IMITATION BY CASTING.

Casting a metal of inferior value, but resembling the coin imitated as much as possible in color, specific gravity, ring, &c., is the simplest kind of counterfeiting practised, but is limited exclusively to the imitation of silver coin. It is very easily executed upon our present coin, is much practised, and, though not very specious, is dangerous.

II. THE GILDING FRAUD.

The gilding fraud is usually effected by stamping a soft metal of inferior value, and then coating it with silver or gold by means of the electro-bath, or covering it with silver or gold-leaf, as in ordinary gilding.

The die with which the impression is struck is generally a mere cast from the genuine coin, made in a hard but fusible metal. The color of the compound is immaterial, being concealed by the subsequent gilding operation. Even the sound, and, in the case of silver coins, the density also, are obtainable. This fraud, it must therefore be clearly seen, is a most specious and dangerous one. Our inquiries lead us to believe that it is carried on, at the present time, to a formidable extent.

III. COINING ALLOYS, RESEMBLING GOLD AND SILVER, BUT CONTAINING NEITHER.

This fraud consists in coining a metal of inferior value, but resembling the genuine coin as nearly as possible in color, density, and ring, either with or without a coating of precious metal. Such compositions being generally very hard, require for the impression a steel die. Nevertheless, the higher grade of skill demanded in the execution of such dies, does not exclude the production, to a very considerable extent, of this variety of counterfeit.

IV. COUNTERFEITS WITH ALLOY ABOVE THE STANDARD AMOUNT.

This fraud consists in coining a compound containing a liberal proportion of precious metal, but still much poorer than the genuine coin.

It is attended with so little profit, compared with other modes of counterfeiting on account of the skill and machinery required, that it is not extensively practiced.

V. THE ENCASING PROCESS.

This mode of counterfeiting consists in enveloping a cheap metal within thin soldered disks of precious metal, and then striking the planchet in a coining press.

With a die and press at command, the fraud is easily practiced. It has been pronounced, by the "Director of the Mint," according to the statement of Dr. Barclay, as the most dangerous which has attracted his notice.

VI. ALTERING AND GILDING CERTAIN SILVER COINS IN IMITATION OF GOLD COINS.

This fraud is performed by electro-coating, or otherwise gilding, certain silver coins, after scraping off particular portions, in order to make them conform more closely to certain gold coins which they resemble in other respects.

Some of our *old half dollars* are susceptible of being thus transformed into *eagles*.

VII. THE FACING FRAUD.

This species of deception is accomplished by removing one of the faces of a silver coin, and soldering the thin face of a gold coin of similar dimensions upon the silver coin, suitably gilded. Thus the half dollar of 1801, harmonizes sufficiently well with the eagle of our earlier coinage to deceive the unpractised.

This fraud, however, is one which cannot be extensively perpetrated, at the present time, since our gold and silver coins differ from each other, in their dimensions and designs more widely than formerly.

VIII. THE SAWING AND INSERTING FRAUD.

This fraud is practiced by sawing apart the two faces of a gold coin, and inserting between them a planchet of base metal by solder, in place of the precious metal thus removed, the circumference being gilded to conceal the interposed metal.

How far counterfeits of this description have been circulated, we have been unable to ascertain.

IX. THE DRILLING AND PLUGGING FRAUD.

This method of impairing coin is performed by drilling the coin edgewise, and plugging the perforation with base metal, the outer extremity being closed with precious metal.

Upon the larger denominations of coin, and especially of gold, there is much temptation to this fraud, since it is easily accomplished, and may be made highly remunerative.

X. THE EVICERATING FRAUD.

This very lucrative mode of impairing coin, without appreciably diminishing its weight, or affecting either the impressions on its face, its dimensions, or its appearance, is performed by removing one of the faces of the coin by means of the lathe as far as the headed circle, or even to the edge, and turning out so much of the contents as will leave a mere shell. The corresponding thin face of another similar coin, exactly fitting the conical aperture left by the removal of the other is then soldered on, the cavity having been previously filled with a fusible alloy of platinum so exactly to preserve the correct weight.

A counterfeit of this description has been recently circulated, and can be detected by those only who are expert in examining coins.

XI. THE PERIPHERAL FRAUD.

This fraud consists in removing from the circumference of coin more or less of the metal by means of the turning lathe and chisel, or the file. Several dimes' worth of precious metal may be thus removed from the larger gold coins, and yet the reading be so perfectly restored by the simplest mechanical device that the loss cannot be discovered, except by means of measurement or weighing.

It is a process easily executed, and one which we have reason to believe is practised to a very considerable extent.

XII. THE GALVANO-PLASTIC FRAUD.

By means of the electrotype process, one of the faces, and the periphery of the coin, are deposited quite thin in precious metal. The other face is made in like manner, and of the exact size, and the hollow portion being filled with a platinum alloy of proper weight, the two are adjusted and soldered together.

The accuracy and economy of this mode of copying the designs of coins, renders it a fraud not difficult to accomplish, and offers to dishonesty the incentive of large profits.

XIII. THE SWEATING FRAUD.

This method of reducing the value of coin consists in abstracting a portion of precious metals by means of mercury.

If the process be carefully conducted and not carried too far, the coin may be robbed to a very serious extent, and yet the impressions on its faces not to be so observably impaired as to awaken suspicion.

XIV. CHEMICAL REDUCTION.

This fraud, sometimes also called "sweating," is performed by exposing coin to the action of dissolving liquids; for silver, nitric acid is usually employed; and for gold, the mixture of nitric and hydrochloric acids. This process is greatly more lucrative than the one with mercury, and is indeed, in our opinion, by far the most dangerous of all the methods by which our coinage is tampered with.

This danger arises from the cheapness, facility, and impunity from discovery with which a profitable amount of gold or silver can be removed from the coins. Experiments have shown that it can be practised to an extent to reduce a coin almost one tenth of its value, without greatly endangering a detection of the fraud by the incautious or unobserving.

In the course of the inquiry which has enabled us to exhibit the foregoing classification, the truth has become painfully apparent, that notwithstanding the guards of artistic skill and mechanical ingenuity in aid of legal authority, by which it has been hoped to protect our coinage, the system is yet not only *open* to the frauds enumerated, but is *actually* so tampered with to an alarming extent.

We have been informed, upon good authority, that not less than *one per cent.* of the silver and as much as *two per cent.* of the gold coin in circulation is either spurious or has been impaired in value, and yet by processes so speciously performed as daily to deceive banks and brokers.

That some of the above detailed modes of counterfeiting, falsifying, or depleting our coins should be practised to the extent which is done ceases to be a matter of surprise when we reflect that during the past thirty years, amid the improvements which have arisen in machinery, and the developments made in the chemical arts, giving facility and resources to the dishonest for the accomplishment of their frauds, the *main features* of legitimate coin-making have undergone but little change. On the contrary, when it becomes understood how small is the risk of detection in the case of several of the frauds, and what little expenditure of skill and capital is requisite for conducting this most lucrative species of imposture, we may regard it as a subject of congratulation, if not of wonder, that the contamination of our currency is not greater than is found to exist.

To realize the force and justness of these remarks, it is only requisite for one to familiarize himself with these processes described in the preceding pages, under the titles of "imitation of casting," "the gilding fraud," and the "chemical reduction." To conduct them profitably, and to an extent to flood the currency with adroitly forged coins, in imitation of almost every denomination, from the silver dime up to the twenty dollar gold piece, or with the genuine coin, impaired in value by a reduction in weight, the entire stock in trade consists of a few simply-constructed molds, a quantity of inexpensive fusible alloy, a few books of gold leaf, or a solution of electrotyping liquid, with a small galvanic battery, and a few pounds of nitric and hydrochloric acids.

Such being the state of things, the question may be reasonably asked, why has not some plan been *heretofore* devised to meet so imperative a want—to arrest this grave and growing evil?

The answer, we believe, is to be found in the fact that the problem being a difficult and complex one, and offering to individual enterprise but little promise of reward, since governments alone exercise the right to issue coin, seems, until the researches of Dr. Barclay, not to have been investigated in that broad and comprehensive manner which could alone lead to satisfactory results.

By ascertaining first, through a careful survey of the subject, the nature of the various fraudulent practices to which our coins are exposed, and thereby obtaining in a single picture, as it were, a view of the various processes in their resemblances and dissimilitudes, Dr. Barclay laid for himself a groundwork upon which to construct a system for their prevention.

By pursuing this course, it was possible, for example, to study in juxtaposition and contrast the fraud of *casting*, with that of *stamping* a base alloy, or the counterfeit of *gilding* with that of *encasing*, or even the fraud of *plugging and drilling*, with the still more unlike process of *chemical reduction*, and thus to be enabled to submit the preventive devices, each to the test of reason and experiment, to determine their adaptation to all the diversified exigencies they were required to encounter.

The result of a study thus directed has been the invention of a plan of coinage, which, we believe, if fully carried out by the government, with the resources which it could well afford to devote to so important an object, can scarcely fail either altogether to relieve our currency from the frauds of counterfeiters or so far render their attempts upon its integrity unremunerative as to disarm them of their danger.

We have carefully examined, with all the means of investigation at our command, each of the several devices which Dr. Barclay proposes to include in the manufacture of coins, and would express the opinion that his suggestions are founded in good sense and upon correct principles, and that they are eminently *practical* in their nature.

They involve no violent innovations, nor any change of a kind which could offend good taste.

On the contrary, a coin so made, while less liable to loss by abrasion, even assuming that its dimensions remain unaltered, and proof against the designs of the dishonest would be no less convenient for use, nor attractive in appearance, than those now in circulation. In this connection, it is due to Dr. Barclay to bear testimony not only to the philosophic zeal which has characterized his devotion to the undertaking and the ingenuity with which he has combatted the difficulties in his paths, but also to the rational aim which has prevailed throughout his efforts to harmonize his improvement, as far as practicable, with the present state of things, so that prejudice based on long habit might be more readily led to acquiesce in his suggestions.

It has not been in our power, because of insufficient funds for the purpose, to have prepared in complete detail and finish a *specimen* coin to submit to the department. To make a *single* such piece, blending that perfection of artistic design and mechanical execution which would commend it for acceptance with the protective features Dr. Barclay desires to incorporate, would require the construction of machinery on a scale and at a cost adequate for regular mining business, and, of course, not to be attempted in a preliminary experimental inquiry.

Therefore, as already intimated by a remark made early in this communication, less expensive expedients have been resorted to by which to test the feasibility of the methods through which Dr. Barclay seeks to accomplish the ends of his undertaking.

The conclusion to which this investigation has brought us is, that it

is altogether within the reach of the present advanced skill in workmanship and perfection in mechanism to combine in our coinage all the improvements which Dr. Barclay would employ for the protection of the currency. In expressing this opinion, we have the sustaining testimony of some of the most experienced artizans, who express themselves as ready both to undertake the execution of the plan, and to guaranty its accomplishment.

In view of the results of our investigations, and of the magnitude of the interests involved, we feel it to be our duty in concluding the present report, to recommend in the strongest terms the adoption by government of such measures as may be necessary to embody in the practical form of a completed coin the several protective devices which have been suggested.

The appropriation which would be demanded for this, considerable as it might be deemed, would, we feel assured, be utterly insignificant in amount compared with the vast pecuniary and moral benefits which the proposed reforms would confer upon the country.

We feel confident, from our examination of the subject, in all its bearings, that the mechanical, artistic, and scientific capacity of the country, applicable to this object, *if wielded by the resources* of the government, and directed as suggested by Dr. Barclay, would furnish a protection completely setting at defiance the dishonest ingenuity which the limited capital of individuals could command.

Very respectfully, your obedient servant,

R. E. ROGERS.
HENRY VETHAKE.

Hon. HOWELL COBB,
Secretary of the Treasury.